

REMARKS

STATUS OF CLAIMS

Claims 1-19 are pending. Claims 7-9 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,937,813 to Schenk. *See Examiner's Office Action* p.2 (17 May 2002). The Claims 1-6 and 10-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,937,813 to Schenk, combined with U.S. Patent No. 5,136,576 to Brownlie. *Id.* Claims 17-19 are new claims, added by amendment herein.

CLAIM REJECTIONS -- 35 USC § 102

Claims 7-9 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,937,813 to Schenk. *See Examiner's Office Action* p.2 (17 May 2002). Applicant respectfully shows below that the art of record does not establish a prima facie case of unpatentability of Claims 7-9, and therefore respectfully asks that Examiner Nguyen (hereinafter "Examiner") hold such claims allowable.

I. MPEP Standards for Determining Anticipation¹

An examiner bears the initial burden of factually supporting any prima facie conclusion of anticipation. *In Re Skinner*, 2 USPQ 2d 1788, 1788-89 (B.P.A.I. 1986); *MPEP* § 2107 (citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) ("The examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability. . .")). Failure of an examiner to meet his burden entitles an applicant to a patent. *Id.* ("[i]f examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent").

The MPEP indicates that in order for an examiner to establish a prima facie case of anticipation of an applicant's claim, the examiner must first interpret the claim², and thereafter

¹ Applicant is aware that Examiner is familiar with the MPEP standards. Applicant is merely setting forth the MPEP standards to serve as a framework for Applicant's arguments following. Should Examiner disagree with Applicant's characterization of the MPEP standards, applicant respectfully requests correction.

show that the cited prior art discloses the same elements, in the same arrangement, as the elements of the claim which the examiner asserts is anticipated. More specifically, the MPEP states that “[a] claim is anticipated *only if each and every element as set forth in the claim is found*, either expressly or inherently described, in a single prior art reference. . . . The identical invention must be shown in as complete detail as is contained in the . . . claim. . . . The elements must be arranged as required by the claim”). *MPEP* § 2131. Consequently, under the guidelines of the MPEP set forth above, if there is *any* substantial difference between the prior art cited by an examiner and an applicant’s claim which the examiner asserts is rendered obvious by the prior art, the prior art does NOT establish a prima facie case of anticipation and, barring other rejections, the applicant is entitled to a patent on such claim.

II. Art of Record Does Not Establish Prima Facie Case of Anticipation of Claims 7-10

A. Claims 7-10

1. Independent Claim 7

Independent Claim 7 recites as follows:

A method for compensating for non-linearities introduced into a digital communication system, said method comprising the steps of:

[a] sampling an analog output signal provided by a local transmitter, said analog output signal including characteristics associated with a nonlinearity introduced by said local transmitter;

[b] converting said analog output signal into a corresponding digital signal; and

[c] producing a compensated digital signal for receipt by a local receiver, wherein said nonlinearity is substantially eliminated from the compensated digital signal.

² The rules for claim interpretation with respect to an anticipation rejection are essentially the same as with respect to an obviousness rejection, and are set forth in section I(B)(1), below.

2. Claim 7, Clause [a]

As set forth above, Claim 7, Clause [a] recites as follows: "*sampling an analog output signal provided by a local transmitter*, said analog output signal including characteristics associated with a nonlinearity introduced by said local transmitter." (emphasis added).

Applicant respectfully points out that with respect to these clauses, Examiner has previously stated "Schenk discloses ... sampling an analog output signal provided by a local transmitter, said analog output signal including characteristics associated with a nonlinearity introduced by said local transmitter (figure 1, col. 3 line 26 to col. 4 line 33)" *Examiner's Office Action 3* (17 May 2002).

Applicant has studied the art cited by Examiner, and respectfully points out that the figure (e.g., Figure 1 of Schenk) and text (e.g., col. 3 line 26 to col. 4 line 33) cited by Examiner do not show "*sampling an analog output signal provided by a local transmitter*" as recited by Applicant's claim. Rather, the cited text and figure of Schenk show the "linear echo compensator" and the "non linear echo compensators" of Schenk receiving *digital* input. See *Schenk '813 patent* Figure 1 (no compensators receive signals from D/A converter fed by line SL2: LK, NK1, and NK2 are all receiving *digital* input). Specifically, the text of Schenk states

A first echo compensator LK has a first input terminal coupled to the input line IN, and, according to the digital signals (transmitted signals) transmitted via the line IN, forms compensation signals that are linearly related to the transmitted signals. See *Schenk '813 patent* col. 4, .lines 8-12.

A second echo compensator NK1 has a first input terminal coupled to the output terminal of linear echo compensator LK via data lines SL3. See *Schenk '813 patent* col. 4, .lines 20-22.

In addition, a third echo compensator NK2 is also provided. Echo compensator NK2 has a first input terminal coupled to an output terminal of the output stage S1 of the transmitter T, via a parallel line SL4.... See *Schenk '813 patent* col. 4, .lines 26-33.

The transmission facility is provided with a transmitter T ... provided with an output stage designated S1, which is coupled to a digital/analog converter D/A via a line SL2. See *Schenk '813 patent* col. 3, .lines 10-20.

Thus, as can be seen from the foregoing cited figures and text of Schenk, Schenk does not show "*sampling an analog output signal provided by a local transmitter*" as recited by

Applicant's Claim 7.³ Accordingly, insofar as that the art of record does not show or suggest the recitations of Claim 7, Clause [a]. Accordingly, in light of the MPEP standards for patentability as set forth above, Claim 7 is not anticipated by the art of record, and hence Applicant respectfully requests that Examiner hold Claim 1 allowable for at least the foregoing reasons.

3. Claim 7, Clause [b]

As set forth above, Claim 1, Clause [b] recites as follows: "converting said analog output signal into a corresponding digital signal." This step is also not present in Schenk '813 in the manner claimed in the present invention. As has just been demonstrated, the art of record does not show "*sampling an analog output signal provided by a local transmitter*" as recited by Clause [a]. Accordingly, it follows that the art of record cannot show "converting *said analog output signal* into a corresponding digital signal" as recited by Clause [b]. Accordingly, insofar as that the art of record does not show or suggest the recitations of Claim 7, Clause [a]. Accordingly, in light of the MPEP standards for patentability as set forth above, Claim 7 is not anticipated by the art of record, and hence Applicant respectfully requests that Examiner hold Claim 1 allowable for at least the foregoing reasons.

B. Dependent Claims 8-10

Claims 8-10 depend either directly or indirectly from Independent Claim 7. "A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 USC § 112 paragraph 4. Consequently, Dependent Claims 8-10 are

³ As noted, Examiner cited a large range of text in rejecting Applicant's Claim 7. Accordingly, Applicant has responded to such rejection by demonstrating that those devices which are receiving input from the transmitter do not teach Applicant's Claim 7 recitations. With respect to Examiner's obviousness rejections of Claims 1-6 and 10-16, Examiner gave citations identifying Schenk's sampling of a mixture of received signals as a teaching of Applicant's Claim 1 recitations of "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*." As set forth below in relation to Applicant's Claim 1, Applicant asserts that Schenk does not show such recitations, for at least the fact that the mixture of signals identified by Schenk does not teach the "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*" of Applicant's Claim 1. Insofar as that Examiner might have intended a similar line of reasoning to be applied against Claim 7, Applicant hereby asserts that Schenk does not teach the "*sampling an analog output signal provided by a local transmitter*" for substantially the same reason Schenk does not teach the recitations of Applicant's Claim 1-. Such arguments are not reproduced here for the sake of brevity.

not rendered unpatentable by the art of record for at least the same reasons why Independent Claim 7 is not rendered unpatentable by the art record. Accordingly, applicant respectfully requests that Examiner hold Claims 8-10 allowable for at least these reasons.

CLAIM REJECTIONS -- 35 USC § 103

Claims 1-6 and 10-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,937,813 to Schenk, combined with U.S. Patent No. 5,136,576 to Brownlie. *See Examiner's Office Action* p.2 (17 May 2002). Applicant respectfully shows below that the art of record does not establish a prima facie case of unpatentability of Claims 1-6 and 10-16, and therefore respectfully asks that Examiner hold such claims allowable.

I. A. MPEP Standards for Determining Obviousness

"[T]he examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness⁴." *MPEP* § 2142. The MPEP states as follows: "the examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant. . . . If examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent." *MPEP* § 2107 (citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)). Accordingly, unless and until an examiner presents evidence establishing prima facie unpatentability, an applicant is entitled to a patent on all claims presented for examination.

The MPEP indicates that in order for an examiner to establish a prima facie case that an invention, as defined by a claim at issue, is obvious the examiner must (1) interpret the claim at issue; (2) define one or more prior art reference components relevant to the claim at issue; (3) ascertain the differences between the one or more prior art reference components and the elements of the claim at issue; and (4) adduce objective evidence which establishes, under a

⁴ An invention, as embodied in the claims, is rendered obvious if an examiner concludes that although the claimed invention is not identically disclosed or described in a reference, the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *MPEP* § 2141 (citing 35 U.S.C. § 103).

preponderance of the evidence standard, a teaching to modify the teachings of the prior art reference components such that the prior art reference components can be used to construct a device substantially equivalent to the claim at issue. This last step generally encompasses two sub-steps: (1) adducement of objective evidence teaching how to modify the prior art components to achieve the individual elements of the claim at issue; and (2) adducement of objective evidence teaching how to combine the modified individual components such that the claim at issue, as a whole, is achieved. *MPEP* § 2141; *MPEP* § 2143. Each of these forgoing elements is further defined within the *MPEP*. *Id.*

A. Interpreting a Claim at Issue

With respect to interpreting a claim at issue, the *MPEP* directs that, during examination -- as opposed to subsequent to issue - such claim be interpreted as broadly as the claim terms would reasonably allow, in light of the specification, when read by one skilled in the art with which the claimed invention is most closely connected. *MPEP* § 2111. In practice, this is achieved by giving each of the terms in the claim the "plain meaning" of the terms as such would be understood by those having ordinary skill in the art, and if portions of the claim have no "plain meaning" within the art, or are ambiguous as used in a claim, then the examiner is to consult the specification for clarification. *Id.*

B. Definition of One or More Prior Art Reference Components Relevant To the Claim at Issue

Once the claim at issue has been properly interpreted, the next step is the definition of one or more prior art reference components relevant to the properly interpreted claim at issue. With respect to the definition of one or more prior art reference components relevant to the claim at issue, the *MPEP* defines three proper sources of such prior art reference components, with the further requirement that each such source must have been extant at the time of invention to be considered relevant. These three sources are as follows: patents as defined by 35 U.S.C. § 102, printed publications as defined by 35 U.S.C. § 102, and information

(e.g., scientific principles) deemed to be “well known in the art”⁵ as defined under 35 U.S.C. § 102. *MPEP* § 2141.

C. Ascertainment of Differences between Prior Art Reference Components and Claim at Issue; Teaching to Modify and/Or Combine Prior Art Reference Components to Remedy Those Differences In Order To Achieve Recitations of Claim at Issue

With one or more prior art components so defined and drawn from the proper prior art sources, the differences between the one or more prior art reference components and the elements of the claim at issue are to be ascertained. Thereafter, in order to establish a case of prima facie obviousness, an examiner must set forth a rationale, supported by objective evidence⁶ sufficient to demonstrate under a preponderance of the evidence standard, that in the prior art extant at the time of invention there was a teaching to modify and/or combine the one or more prior art reference components to construct a device practicably equivalent to the claim at issue.

The preferable evidence relied upon is an express teaching to modify/combine within the properly defined objectively verifiable sources of prior art. In the absence of such express teaching, an examiner may attempt to establish a rationale to support a finding of such teaching reasoned from, or based upon, express teachings taken from the defined proper sources of such evidence (i.e., properly defined objectively verifiable sources of prior art). *MPEP* § 2144; *In re Dembcizak*, 50 USPQ2d 1614 (Fed. Cir. 1998).

⁵ The fact that information deemed to be “well known in the art” can serve as a proper source of prior art reference components seems to open the door to subjectivity, but such is not the case. As a remedy to this potential problem, *MPEP* § 2133.03 states that if an examiner asserts that his position is derived from and/or is supported by a teaching or suggestion that is alleged to have been “well known in the art,” and that if an applicant traverses such an assertion (that something was “well known within the art”), the examiner must cite a reference in support of his or her position. The same *MPEP* section also states that when a rejection is based on facts within the personal knowledge of an examiner, the data should be stated as specifically as possible, and the facts must be supported, when called for by the applicant, by an affidavit from the examiner. Such an affidavit is subject to contradiction or explanation by the affidavits of the applicant and other persons. *Id.* Thus, all sources of prior art reference components must be objectively verifiable.

⁶ The proper sources of the objective evidence supporting the rationale are the defined proper sources of prior art reference components, discussed above, with the addition of factually similar legal precedent. *MPEP* § 2144.

The MPEP recognizes the pitfalls associated with the tendency to subconsciously use impermissible “hindsight” when an examiner attempts to establish such a rationale. The MPEP has set forth at least two rules to ensure against the likelihood of such impermissible use of hindsight. The first rule is that “under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical ‘person of ordinary skill in the art’ when the invention was unknown and just before it was made. In view of all factual information⁷, the examiner must then make a determination whether the claimed invention ‘as a whole’ would have been obvious at that time to that person. Knowledge of an Applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the ‘differences’, conduct the search, and evaluate the ‘subject matter as a whole’ of the invention. The tendency to resort to ‘hindsight’ based upon an Applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.” *MPEP* § 2142 (emphasis added). Thus, if the only objective evidence of such teaching to modify and/or combine prior art reference components is an applicant’s disclosure, no evidence of such teaching exists⁸.

The second rule is that if an examiner attempts to rely on some advantage or expected beneficial result that would have been produced by a modification and/or combination of the prior art reference components as evidence to support a rationale to establish such teachings to modify and/or combine prior art reference components, the MPEP requires that such advantage or expected beneficial result be objectively verifiable teachings present in the acceptable sources of prior art (or drawn from a convincing line of reasoning based on objectively verifiable established scientific principles or teachings). *MPEP* § 2144. Thus, as a guide to avoid the use of impermissible hindsight, these rules from the MPEP make clear that

⁷ “Factual information” is information actually existing or occurring, as distinguished from mere supposition or opinion. *Black’s Law Dictionary* 532 (5th ed. 1979).

⁸ An applicant may argue that an examiner’s conclusion of obviousness is based on improper hindsight reasoning. However, “[a]ny judgment on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant’s disclosure, such a reconstruction is proper.” *MPEP* § 2145(X)(A) (emphasis added).

absent some objective evidence, sufficient to persuade under a preponderance of the evidence standard, no teaching of such modification and/or combination exists.

II. Art of Record Does Not Establish Prima Facie Case of Obviousness of Claims 1-6

A. Claims 1-6

1. Independent Claim 1

Independent Claim 1 recites as follows:

An echo cancellation method for a digital data communication system comprising a first device having a first transmitter and a first receiver, and a second device having a second transmitter and a second receiver, wherein said first transmitter is configured to transmit signals to said second receiver over a downstream communication channel, said first receiver is configured to receive signals from said second transmitter over an upstream communication channel, and an echo channel conveys echo signals between said first transmitter and said first receiver, said method comprising the steps of:

[a] generating an analog output signal by said first transmitter for receipt by said second receiver;

[b] sampling said analog output signal; and

[c] performing echo cancellation based on said analog output signal, wherein said echo cancellation cancels the echo signals conveyed by said echo channel.

2. Claim 1, Clauses [a]-[b]

As set forth above, Claim 1, Clause [a] recites as follows: "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*." (emphasis added). As further set forth above, Claim 1, Clause [b] recites as follows: "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*." (emphasis added).

With respect to Clause [a], Examiner has stated "Schenk discloses ... generating an *analog output signal* by said first transmitter for receipt by said second receiver (col. 3 lines 26-32)" *Examiner's Office Action* 3 (17 May 2002). With respect to Clause [b] Examiner has stated "Schenk discloses ... sampling said analog signal." *Id.*

The art cited by Examiner, as showing "generating an *analog output signal* by said first transmitter for receipt by said second receiver" states

The analog signals occurring at the output terminal of said A/D converter are transmitted as transmitted signals via a hybrid circuit H to the two-wire line TWL. At the same time, the hybrid circuit H accepts the analog signals received by the transmission facility shown in FIG. 1 as received signals and supplies the received signals to a receiver R. *See Schenk '813 patent* col. 3, lines 26-32.

The art cited by Examiner, as showing "sampling *said analog output signal*"

The *A/D converter samples the mixture of signals*, from hybrid circuit H and converts the samples into correspondingly coded bit groups which occur at the multibit parallel output terminal of the A/D converter. *See Schenk '813 patent* col. 3, lines 45-49 (emphasis added).

Applicant respectfully points out that in Schenk the "mixture of signals" referred to in the foregoing quote is not the same the analog output of the D/A converter in Schenk Figure 1 and does not teach the recitations of Applicant's Claim 1. That this is true can be seen by quoting just a few more words from Schenk in addition to those quoted by Examiner. Specifically, Schenk states:

In addition to the received data signals, receiver R also receives noise, signals, designated as echo signals, through the hybrid circuit H. ... The receiver thus receives not only the actual received signals, but also a mixture of signals formed by the received signals and the echo signals. Receiver R includes an analog/digital converter A/D.... The A/D converter samples the mixture of signals, from hybrid circuit H and converts the samples into correspondingly coded bit groups which occur at the multibit parallel output terminal of the A/D converter. *See Schenk '813 patent* col. 3, lines 32-49.

Thus, as can be seen from the foregoing cited figures and text of Schenk, Schenk does not show "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*" as recited by Applicant's Claim 1.⁹ Rather,

⁹ As noted, above, Applicant demonstrated that the echo cancellers of Schenk do not teach the "*sampling an analog output signal provided by a local transmitter*" of Applicant's Claim 7. Insofar as that Examiner might have intended a similar line of reasoning to be applied against Claim 1, Applicant hereby asserts that Schenk does not teach the

as has been demonstrated, Schenk shows that a "receiver .. receives ... a mixture of signals formed by the received signals and the echo signals [and that] the A/D converter samples the mixture of signals." Accordingly, the art of record does not show the recitations of Claim 1, Clauses [a]-[b]. Applicant respectfully asserts that as has been shown, on its face Schenk does not teach "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*," but rather teaches sampling the mixture of signals taught by Schenk; in the event that Examiner maintains that one having ordinary skill in the art would equate the operations on the mixture of signals taught in Schenk with "generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*" as recited by Applicant's claim, Applicant hereby requests documentary evidence in support of such assertion under the MPEP standards set forth above (e.g., e.g., MPEP § 2133.03 which states that if an examiner asserts that his position is derived from and/or is supported by a teaching or suggestion that is alleged to have been "well known in the art," and that if an applicant traverses such an assertion (that something was "well known within the art"), the examiner must cite a reference or supply an affidavit in support of his or her position.)

As has been demonstrated, the art of record does not show the recitations of Claim 1, Clauses [a]-[b]. So far as Applicant is aware, no art is of record teaching a modification of Schenk to reach the recitations of Applicant's Claim 1 has been identified. Accordingly, insofar as that the art of record does not show or suggest the recitations of Claim 1, Clauses [a]-[b], in light of the MPEP standards for patentability as set forth above, Claim 1 is not rendered unpatentable by the art of record, and hence Applicant respectfully requests that Examiner hold Claim 1 allowable for at least the foregoing reasons.

3. Claims 2-6

Claims 2-6 depend either directly or indirectly from Independent Claim 1. "A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 USC § 112 paragraph 4. Consequently, Dependent Claims 2-6 are

"generating an *analog output signal* by said first transmitter for receipt by said second receiver; sampling *said analog output signal*" of Applicant's Independent Claim 1 for substantially the same reason Schenk does not teach the recitations of Applicant's Claim 7. Such arguments are not reproduced here for the sake of brevity.

not rendered unpatentable by the art of record for at least the same reasons why Independent Claim 1 is not rendered unpatentable by the art record. Accordingly, applicant respectfully requests that Examiner hold Claims 2-6 allowable for at least these reasons.

III. Art of Record Does Not Establish Prima Facie Case of Obviousness of Claims 11-16

A. Claims 11-16

1. Independent Claim 11

Independent Claim 11 recites as follows:

A communication device for compensating for non-linearities and echo signals present in a digital communication system, said device comprising:

[a] a transmitter for providing an analog output signal;

[b] a receiver for receiving a compensated digital signal; and

[c] an echo canceler having an input signal and an output signal, wherein said input signal is essentially the analog output signal, and said output signal is representative of the echo signal and the non-linearities present in said digital communication system; and

[d] means for producing said compensated digital signal in response to the output signal of said echo canceler and a signal sent by a second communication device associated with said digital communication system.

2. Claim 11, Clause [c]

As set forth above, Claim 11, Clause [c], as amended herein, recites as follows: "an echo canceler having an input signal and an output signal, wherein said input signal is essentially the analog output signal."

Applicant respectfully points out that with respect to Clause [c], Examiner has previously stated "In claim 11, Schenk discloses further an echo canceler having an input signal

and an output signal, wherein said input signal is operatively associated either the analog input signal (col. 3 line 26 to col. 4 line 33)" *Examiner's Office Action* 3 (17 May 2002).

Applicant respectfully points out that Clause [c] has now been amended to recite "an echo canceler having an input signal and an output signal, wherein said input signal is essentially the analog output signal."¹⁰ It has been shown in detail above, in relation to Claims 7-10, the text and drawings of Schenk does not show the echo cancellers of Shenck as having as input "an analog output signal provided by a local transmitter." Accordingly, for reasons similar to those set forth in relation to the foregoing recitations of Claim 7, the Schenk '813 patent does not show the "echo canceler having an input signal ... wherein said input signal is essentially the analog output signal" recitations of Claim 11, Clause [c]. Accordingly, the art of record does not show the recitations of Claim 11, Clause [c].

As has been demonstrated, the art of record does not show the recitations of Claim 11, Clause [c]. So far as Applicant is aware, no art is of record teaching a modification of Schenk to reach the recitations of Applicant's Claim 11. Accordingly, insofar as that the art of record does not show or suggest the recitations of Claim 11, Clause [c], in light of the MPEP standards for patentability as set forth above, Claim 11 is not rendered unpatentable by the art of record, and hence Applicant respectfully requests that Examiner hold Claim 11 allowable for at least the foregoing reasons.

3. Claims 11-16

Claims 12-16 depend either directly or indirectly from Independent Claim 11. "A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 USC § 112 paragraph 4. Consequently, Dependent Claims 12-16 are not rendered unpatentable by the art of record for at least the same reasons why Independent Claim 1 is not rendered unpatentable by the art record. Accordingly, Applicant respectfully requests that Examiner hold Claims 12-16 allowable for at least these reasons.

¹⁰ "During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.'" *MPEP* § 2111. Applicant respectfully asserts that, had Examiner applied the foregoing rule, Examiner would have interpreted the unamended language of Claim 11 to be as such has been explicitly amended herein. Accordingly, Applicant respectfully asserts that the amendment to Claim 11 is not a narrowing amendment, in that such amendment merely makes explicit what was implicit in light of the foregoing MPEP rule.

NEW CLAIMS 17, 18 AND 19

Applicant has added new claims 17, 18, and 19. Insofar as no art has been cited against the recitations of such claims, Applicant respectfully asserts that, under the MPEP rules set forth above, such claims are in condition for allowance. In addition, insofar as new Claims 17-19 have recitations similar to the recitations of Claims 1-16 discussed above, Applicant respectfully asserts that new Claims 17-19 are allowable for at least the same reasons why Claims 1-16 are allowable. Accordingly, a notice to that effect is hereby requested.

Notwithstanding the foregoing, Applicant points out that new Claim 17 recites "...detecting a signal on an echo channel associated with an actual echo signal at said second device; and performing echo cancellation based on said sampled analog output signal and said signal on said echo channel." Applicant also points out that new Claim 18 recites "...sampling an analog output provided by a local transmitter, said analog output including a known training signal ...;calculating an estimated echo signal in response to said known training signal; detecting a signal on an echo channel associated with an actual echo signal at a second device; and producing a compensated digital signal for receipt by a local receiver; wherein said nonlinearity is substantially eliminated from the compensated digital signal on the basis of the estimated echo signal and said signal associated with said actual echo signal at said second device." Applicant also points out that new Claim 19 recites "... an input associated, at least in part, with an actual echo signal at a second communication device; and a summing junction operably coupled with the output signal of the echo canceller and further operably coupled with the input associated, at least in part, with said actual echo signal at said second communication device." So far as Applicant is aware, no art of record shows any of the foregoing recitations of Applicant's Claims 17-19. Accordingly, Applicant respectfully requests that Examiner hold Claims 17-19 allowable for at least the foregoing reasons.

IV. Conclusion

Applicant has shown above that the art of record does not establish a prima facie case of unpatentability of Independent Claims 1, 7, 11, 17, 18, or 19. Accordingly, Applicant respectfully requests that Examiner issue a notice of allowance with respect to Independent

Claims 1, 7, 11, 17, 18, or 19. Furthermore, Applicant has shown that the art of record does not establish a prima facie case of unpatentability of either Dependent Claims 2-6, 8-10, or 12-16, which respectively depend from Independent Claims 1, 7, and 11. Accordingly Applicant respectfully requests that Examiner allow Dependent Claims 2-6, 8-10, or 12-16, for at least the same reasons why their respective parent claims are allowable.

All of the claims remaining in the application are clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Lastly, attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings to Show Changes Made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 11 has been amended as follows:

11. (Amended) A communication device for compensating for non-linearities and echo signals present in a digital communication system, said device comprising:
- a transmitter for providing an analog output signal;
 - a receiver for receiving a compensated digital signal; and
 - an echo canceler having an input signal and an output signal, wherein said input signal is ~~operatively associated with~~ essentially the analog output signal, and said output signal is representative of the echo signal and the non-linearities present in said digital communication system; and
- means for producing said compensated digital signal in response to the output signal of said echo canceler and a signal sent by a second communication device associated with said digital communication system.

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